

## TOY CAR RACING APPARATUS

### Background of the Invention

#### Technical Field:

This invention relates to toy car racing tracks which simulate racing  
5 between two cars. Such racing simulations include a starting area and a  
finishing line interconnected by a guide track along which the toy cars travel.  
Specifically, this invention is directed to non-powered toy race cars known within  
the industry as "Hot Wheel" type cars that require an initial incline surface on  
which to gain momentum from the start.

#### 10 Description of Prior Art:

Prior art devices of this type have used a variety of different car track  
configurations emulating drag strip racing in which a pair of toy vehicles are  
staged and then launched down a short track to determine the fastest vehicle i.e.  
player based on car performance and player reaction skills, see for example U.S.  
15 Patents 3,403,908, 3,986,717, 4,605,229, 4,715,602 and 4,876,680.

In Patent 3,403,908 a drag strip for slot cars is shown in which an electric  
power supply is connected to each car independently through a simulated shift



lever. Photocells are used at the starting line to stage the cars which activate a starting signal light sequence. Finish photocells are used to determine a winner.

Patent 3,986,717 discloses a method and apparatus for starting model vehicles on a race track wherein self-powered slot type cars are used. Start  
5 blocks hold the cars stationery until released by the player's activation.

A toy drag strip and starting tower is illustrated in Patent 4,605,229 having a plurality of colored marbles within that roll down simultaneously a progressive simulated starting light display ending in a green go marble.

Patent 4,715,602 claims a racing game apparatus with a pair of inertia  
10 powered toy racing vehicles being released from corresponding starting ramps. A trap door in each ramp allows the vehicle release lever to extend from the track to hold and then selectively release the vehicles for the race.

Finally, Patent 4,876,680 is directed to an electric drag strip apparatus having staging light display for a photo-electric eye positioned at the finish line. A  
15 simulated tire burn-out area is featured to emulate race cars in which the tires are rapidly rotated to heat them up for better performance.

#### Summary of the Invention



A toy car racing track assembly to provide for competitive racing for toy cars. The track assembly combines an electric staging and starting area having an electrically controlled progressive starting light and a remote finish line area. Remote control car release and staging switches allow players to stage and  
5 release their cars independently simulating real racing. The finish line area has mechanically activated electronic timing and winner indication switches that activate corresponding displays.

Sound effects associated with car racing are selectively generated in response to player's input and car position during staging and starting for added  
10 realism.

#### Description of the Drawings

Figure 1 is a perspective view of the staging start area of the invention;

Figure 2 is a perspective view of the finish line area of the invention;

Figure 3 is a partial side elevational view of the invention;

15 Figure 4 is a side elevational view of the start portion of the invention with portions broken away;

Figure 5 is a top plan view of the start portion;

Figure 6 is a bottom plan view of the start portion;



Figure 7 is a front elevational view of the finish line portion;

Figure 8 is a side elevational view of the finish line portion;

Figure 9 is a front elevational view of interconnected track sections of the invention;

5        Figure 10 is a perspective view of the track section of the invention;

Figure 11 is a top view of interconnected track sections of the invention with portions broken away;

Figure 12 is partial sectional view on lines 11-11 of figure 8;

Figure 13 is a bottom plan view of the track interconnector of the  
10    invention;

Figure 14 is an enlarged partial front elevational view of the starting light tower of the invention;

Figure 15 is a side elevational view of the entire race track of the invention;

15        Figure 16 is an enlarged cross-sectional view of the staging and starting switch; and

Figure 17 is a block flow diagram of control circuit of the invention.

#### Description of the Preferred Embodiment



Referring to figures 1-4 of the drawings, a racing track assembly 10 can be seen having an electric start portion 11 and a finish portion 12 interconnected by a track portion 13. The starting portion 11, best seen in figures 1 and 4 of the drawings has a pair of oppositely disposed interconnected support housings 14 and 15 formed therein in the shape of a grandstand with a staging track area at 16 there between. A pair of legs 17 extend from within the respective housings 14 and 15 supporting the starting portion 11 thereby in elevated relation for placement on a ground surface G as best seen in figure 3 of the drawings. The staging track area 16 defines a pair of track paths 19 and 20 on which respective scale model race cars 21 are to be positioned as illustrated in broken lines in figure 4 of the drawings.

A starting tower 22 extends from between the respective track paths 19 and 20 in spaced relation to the respective support housings 14 and 15 as hereinbefore described. The starting tower 22 has a plurality of multi-colored indicator lights assemblies 23 positioned in vertical spaced linear alignment on its front surface at 24. The indicator lights assemblies 23 when activated will correspond to a pre-determined series of progressive starting instructions by which the racer's (not shown) will react as will be described in detail hereinafter.



Each of the track paths 19 and 20 has an electrical vehicle holding and release assembly 25 positioned under and extending partially within the respective track paths 19 and 20.

Referring to figure 4 of the drawings, the holding and release assemblies 5 25 can be seen each having an electric actuation motor 26 with a release arm 27 extending operably there from with an upstanding vertical engagement stop hook 27A on its respective free end, the arms are spring loaded by a pair of resilient elements 27B engaging same. A pair of remote control pedal switches 28 are interconnected to respective actuator motors 26, the indicator lights assemblies 10 23 through and an electronic control and display circuit 29 which is graphically illustrated in a block flow diagram in figures 16 and 17 of the drawings as will be described in greater detail hereinafter.

Referring to figures 3 and 9-13 of the drawings, the track portion 13 includes multiple track segments 30. Each of the track segments 30, best seen 15 in figure 10 of the drawings has oppositely disposed side rails 31 and 32 with continuous support flanges 33A and 33B extending there from. A pair of coplanar track surfaces 34 and 35 extend from between the respective side rails 31 and 32 with respective engagement channels 36 and 37 there between. A



central upstanding track divider 38 extends longitudinally between the track surfaces 34 and 35. The track divider 38 has spaced disposing angular incline side surfaces 38A and 38B and an integral top 39 there between. A track segment connector fitting 40 of the invention can be seen in figures 11, 12 and 13 of the drawings having a pair of contoured track engagement flanges 40A and 40B with an upstanding transversely extending track abutment band 41 there between. Respective band side rails 41A and divider 40C are correspondingly upstanding and are longitudinally angularly inclined. In use, the interengagement flanges 40A and 40B are registerably positioned within the respective channels 36A and 36B of adjacent track segments 30 and so correspondingly configured track engagement end surfaces of the start portion 11 and finish portion 12 for registration therein. It will be noted that due to the aforementioned angular inclination of the band side rails 41A and 41B that an effective non-resistant adjoining surface transition is achieved there between.

Referring back to figure 3 of the drawings, a curved angular inclined transitional track surface fitting 42 can be seen defining a transition between inclined track segment portions 43 extending from the elevated starting position 11 and a horizontally disposed track segment portions at 44 extending from the



finish portion 12. The transitional track surface fitting 42 is contoured hollow body with a track surface 45 formed within and along its upper curved linear surface. Oppositely disposed interconnecting registration back-up plates 46A and 46B are positioned below each end for support. Adjacent abutting track sections 30 are registerable therewith.

The finish portion 12 has a finish line gate assembly 47 as best seen in figures 2, 7, and 8 of the drawings positioned at the end of the horizontal track segments 44 and has a pair of spaced upstanding columns 48 that are interconnected by a bridge closure 49 which is in spaced relation to finish line track surfaces 50A and 50B, best seen in figure 2. A pair of pivoted finish engagement flags 51 and 52 extend downwardly from the bridge enclosure 49 through respective openings therein. The finish engagement flags 51 and 52 are so positioned as to be above respective track surfaces 50A and 50B. The finish engagement flags 51 and 52 pivot upon contact with the race cars 21 after crossing a finish line 53 during play. The finish flags 51 and 52 so pivoted trip respective optical interrupters 54 which are in communication with the electronic control circuit 29, shown in figure 17 of the drawings, which will correspondingly register the elapsed time of the respective race cars and calibrate a winner and



display elapsed time on an interconnected numerical display 56 located on the starting tower 22 and illuminate the respective winning lights 57A or 57B above the respective winning track on the finish gate 45.

In use, for a typical two car race, a pair of the racing cars 21 are  
5 positioned on the track paths 19 and 20 on the staging track area 16. The race cars 21 are held immobile on the inclined track surface by the respective stop hooks 27A portions of the arm 27 as hereinbefore described. The remote control pedal switches 28 as seen in figure 16 of the drawings have a housing 58 with a movable interengaging surface pedal 59 interdisposed thereon. The pedals 59  
10 are resiliently held in position by respective spring members 60. An electric contact switch assembly 61 is selectively engaged by an actuation rod 62 depending from the respective pedals 59 completing an electrical circuit signaling the control circuit 55 as will be well understood by those skilled in the art.

Upon initial pedal depression by the players (not shown) of the race cars  
15 21 are effectively staged activating simultaneously staging lights 63 on the light assemblies 23 and race car sounds stored electronically and played through a sound speaker 64, best seen in figures 4, 5 and 6 of the drawings within the starting portion 11. Then a starting time lighting sequence is activated



progressively illuminating respective lights in the lighting assemblies 23 on the starting tower 22.

The light assemblies 23 lighting sequence comprises a pair of pre-stage on/off yellow lights 65A, player activated staging lights 65B and then sequential  
5 count down lights 65C, including green start lights 65D and red foul lights 66 as illustrated best in figure 14 of the drawings. As in real races the light sequence count down after staging has begun with the final green lights 65C indicating to the drivers to release the cars 21 which they do by depressing the respective pedals 59 a second time. Upon pedal depression, the DC motors 26 are  
10 actuated with the hereinbefore described hook portion 27A against the pre-loaded pressure spring allow the cars 21 to roll free down the respective race track paths 19 and 20 of track portion 13 down the track 43, over the transition fitting 42 and across the horizontally oriented track sections 44 through the finish gate 47 and against the respective engagement finish flag arms 51 and 52  
15 signaling the winner and elapsed time, as noted. The control circuit 55 and interconnecting starting switch assemblies 61, light assemblies 23, graphic display 56, finish gate 47, and sound speaker 64, are all powered by batteries B within a battery holder 69 in the base of the starting gate 11, best seen in figures



4 and 5 of the drawings. Supplemental power can also be supplied by a transformer (not shown) interconnected to 110 volt AC power source as will be typical and well known within the art.

Referring to figures 7 and 8 of the drawings, a manual finish line indicator attachment assembly 70 shown in broken lines can be seen having attachment fitting 71 that is secured over the bridge portion 49 of the finish gate 47 displacing the electronic finish flags 51 and 52 as seen in figure 8 of the drawings at 52'. A contoured win indicator plate 72 is centrally pivoted at 73 and is releasably held in position by a pair of respective tabs 74A and 74B extending from a pair of manual engagement target areas 75 and 76 pivotally connected to the attachment fitting 71.

The contoured win indicator plate 72 will pivot right or left indicating the winning car lane when the corresponding targets 75 or 76 are hit by the respective winning race car 21 releasing same.

The manual finish line indicator assembly 70 can be used, for example, if the batteries B fail or there is no alternate source of power as suggested and noted above.



Individual players (not shown) can manually stage their cars and release them without utilization of electronic control circuit and other aspects of the apparatus described above by use of a manual stage and release assembly 80 as seen in figure 4 of the drawings. A spring-urged push button 81 extends up  
5 through the staging track area 16 between the respective car paths 19 and 20. The button 81 has a pair of oppositely disposed actuation bars 82 extending there from engageable against the respective release arms 27. A player (not shown) can push the manual button 81 releasing the cars 21 staged in the event of power failure as will be understood by those skilled in the art.

10 Referring back to figure 1 of the drawings, the race cars 21 may also have independent self-powered illumination devices indicated at 21A so as to provide reflective illumination onto the corresponding track assembly surfaces.

It will thus be seen that a new and novel toy car racing apparatus has been illustrated and described and it will be apparent to those skilled in the art  
15 that various changes and modifications may be made therein without departing from the spirit of the invention. Therefore I claim: